

The claimed invention is:

1. A method of forming a battery enabled flexible circuit, the method comprising:
 - forming a first insulating layer;
 - positioning at least one battery on the first insulating layer, the at least one battery having at least first and second terminals; and
 - forming a second insulating layer on the first insulating layer and the at least one battery, the first and second insulating layers forming a flexible circuit board.
2. The method of claim 1 further comprising:
 - forming a conductive layer on the first insulating layer for providing at least first and second conductive paths, wherein at least one of the first and second terminals of the at least one battery is in electrical contact with at least one of the first and second conductive paths respectively; and
 - forming vias in the second insulating layer, the vias being in electrical contact with at least one of the first and second terminals.
3. The method of claim 2, wherein the forming the conductive layer further comprises forming a conductive layer including copper or a copper alloy.
4. The method of claim 1, wherein positioning the at least one battery further comprises forming the at least one battery on the first insulating layer using a lamination process.

5. The method of claim 1, wherein positioning the at least one battery further comprises forming the at least one battery on the first insulating layer using a semiconductor fabrication process.
6. The method of claim 1, wherein positioning the at least one battery further comprises removing a portion of the first insulating layer for embedding the at least one battery therein.
7. The method of claim 6, wherein embedding the at least one battery further comprises positioning the at least one battery in the removed portion using a lamination process.
8. The method of claim 6, wherein embedding the at least one battery further comprises forming the at least one battery in the removed portion using a semiconductor fabrication process.
9. The method of claim 6, wherein embedding the at least one battery further comprises embedding a preformed flexible battery in the removed portion.
10. The method of claim 1 further comprising forming the at least one battery on the second insulating layer.

11. The method of claim 1, wherein the forming the first and second insulating layers further comprises forming the first and second insulating layers using a resilient material.
12. The method of claim 1, wherein forming the first and second insulating layers further comprises forming the first and second insulating layers using a lamination process.
13. The method of claim 12 further comprising forming the first and/or second insulating layer using a polyimide material.
14. The method of claim 1, wherein forming the first and second insulating layers further comprises forming the first and second insulating layers using sputter deposition of a polyimide material.
15. The method of claim 1, wherein forming the first and second insulating layers further comprises forming the first and second insulating layers using chemical vapor deposition of a polyimide material.
16. The method of claim 1 further comprising forming the first and second insulating layers on a flexible substrate formed using a semiconductor or fiberglass material.
17. The method of claim 1 further comprising forming electrical components on the second insulating layer.

18. The method of claim 1, wherein the positioning the at least one battery further comprises positioning a thin-film flexible battery.
19. The method of claim 2 further comprising removing a portion of the conductive layer using a semiconductor fabrication process and embedding a flexible battery therein.
20. The method of claim 19, wherein the using the semiconductor fabrication process further comprises etching.
21. The method of claim 1 further comprising positioning a plurality of batteries in a single conductive layer.
22. The method of claim 1 further comprising positioning at least one battery in each of a plurality of insulating and conductive layers for providing multiple power sources.

23. An apparatus providing a battery as an integral part of a circuit, the apparatus comprising:

- a first insulating layer;
- at least one battery positioned on the first insulating layer, wherein the at least one battery having at least first and second terminals; and
- a second insulating layer formed on the first insulating layer and the at least one battery, the first and second insulating layers forming a flexible circuit board.

24. The apparatus of claim 23 further comprising:

- a conductive layer formed on the first insulating layer for providing at least first and second conductive paths, wherein at least one of the first and second terminals of the at least one battery is in electrical contact with at least one of the first and second conductive paths respectively; and
- vias formed in the second insulating layer, the vias being in electrical contact with at least one of the first and second terminals.

25. The apparatus of claim 24, wherein the conductive material further comprises copper or a copper alloy.

26. The apparatus of claim 23, wherein the first and second insulating layers are a resilient material.

27. The apparatus of claim 26, wherein the resilient material is fiberglass.

28. The apparatus of claim 26, wherein the resilient material is polyimide.
29. The apparatus of claim 23, wherein the first and second insulating layers each include one or more layers laminated together.
30. The apparatus of claim 29, wherein the first and/or second insulating layer is a polyimide material.
31. The apparatus of claim 23, wherein the first and second insulating layers include one or more layers formed by sputter deposition of a polyimide material.
32. The apparatus of claim 23, wherein the first and second insulating layers include one or more layers formed by chemical vapor deposition of a polyimide material.
33. The apparatus of claim 23 further comprising a plurality of batteries embedded in one or more insulating or conductive layers.
34. The apparatus of claim 33, wherein the plurality of batteries are laminated in one or more insulating or conductive layers.
35. The apparatus of claim 23 further comprising a plurality of batteries positioned in multiple insulating or conductive layers.

36. A processor comprising:

- a receiving unit for receiving an input signal;
- a processing unit connected to the input unit for processing the input signal, the processing unit having a battery enabled circuit comprising:
 - a first insulating layer;
 - at least one battery, positioned on the first insulating layer, wherein the at least one battery having at least first and second terminals; and
 - a second insulating layer formed on the first insulating layer and the at least one battery, the first and second insulating layers forming a flexible circuit board;

and

- an output, connected to the processing unit, for transmitting a modified input signal.

37. The processor of claim 36 further comprising:

- a conductive layer formed on the first insulating layer for providing at least first and second conductive paths, wherein at least one of the first and second terminals of the at least one battery is in electrical contact with at least one of the first and second conductive paths respectively; and
- vias are formed in the second insulating layer, the vias being in electrical contact with at least one of the first and second terminals.

38. The processor of claim 36 further comprising a plurality of batteries positioned in multiple insulating or conductive layers.

39. The processor of claim 38, wherein the plurality of batteries are laminated in one or more insulating or conductive layers.

40. The processor of claim 36, wherein the first and second insulating layers include one or more layers laminated together.

41. The processor of claim 40, wherein the first and/or second insulating layer is a polyimide material.